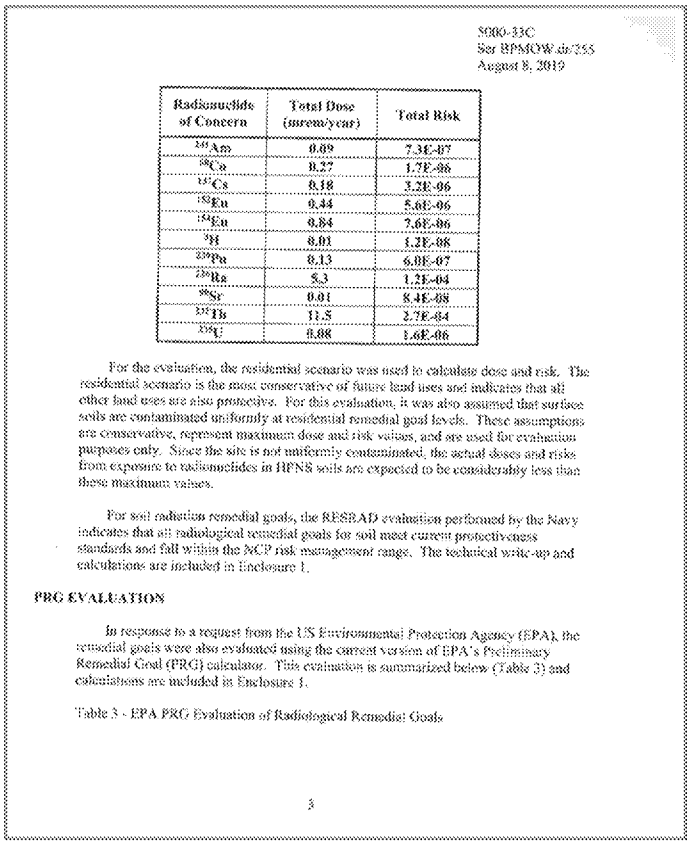
Derek J. Robinson - BRAC Environmental Coordinator HPNS

Dear Mr. Robinson,

As Principle Investigator for the Hunters Point Community Biomonitoring Program established in 2019 to offer safe, confidential urine screenings for residents living within a one mile radius of the federal Superfund site at the Hunters Point Naval Shipyard, I would like to submit preliminary comments on Draft Addendum to the Five Year Review Evaluation of Radiological Remedial Goals for Soil. Please note Table 1 identifies 11 ROC's with soil remediation goals along with RESRAD Evaluation of Radiological Remedial Goals in Table 2.



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Radionuclide of Concern	Total Dose (mrem/year)	Total Risk
^{241}Am	0.09	7.3E-07
^{60}Co	0.27	1.7E-06
^{137}Cs	0.18	3.2E-06
^{152}Eu	0.44	5.0E-06
^{154}Eu	0.84	7.6E-06
^{3}H	0.01	1.2E-08
^{239}Pu	0.13	6.0E-07
^{226}Ra	5.3	1.2E-04
^{90}Sr	0.01	8.4E-08
^{152}Tb	11.5	2.7E-04
^{238}U	0.88	1.6E-06

For the evaluation, the residential scenario was used to calculate dose and risk. The residential scenario is the most conservative of future land uses and indicates that all other land uses are also protective. For this evaluation, it was also assumed that surface soils are contaminated uniformly at residential remedial goal levels. These assumptions are conservative, represent maximum dose and risk values, and are used for evaluation purposes only. Since the site is not uniformly contaminated, the actual doses and risks from exposure to radionuclides in HPNS soils are expected to be considerably less than these maximum values.

For soil radiation remedial goals, the RESRAD evaluation performed by the Navy indicates that all radiological remedial goals for soil meet current protectiveness standards and fall within the NCP risk management range. The technical write-up and calculations are included in Enclosure 1.

PRG EVALUATION

In response to a request from the US Environmental Protection Agency (EPA), the remedial goals were also evaluated using the current version of EPA's Preliminary Remedial Goal (PRG) calculator. This evaluation is summarized below (Table 3) and calculations are included in Enclosure 1.

Table 3 - EPA PRG Evaluation of Radiological Remedial Goals

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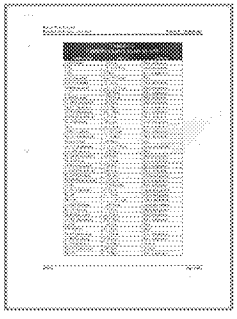
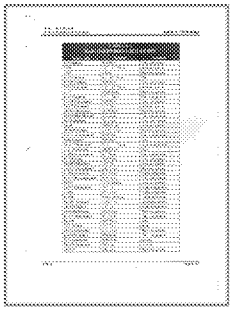
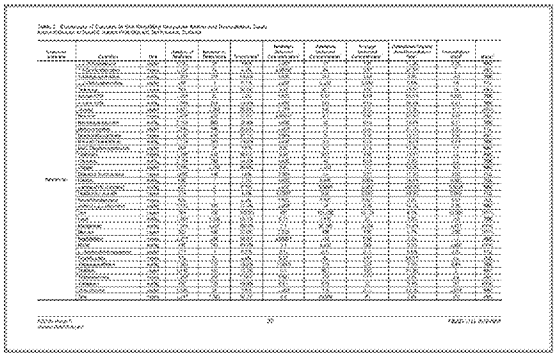
Tables 4-2 through 4-2 Section 4 of the Final Historical Radiological Assessment identifies hundreds of radionuclides were used at HPS:

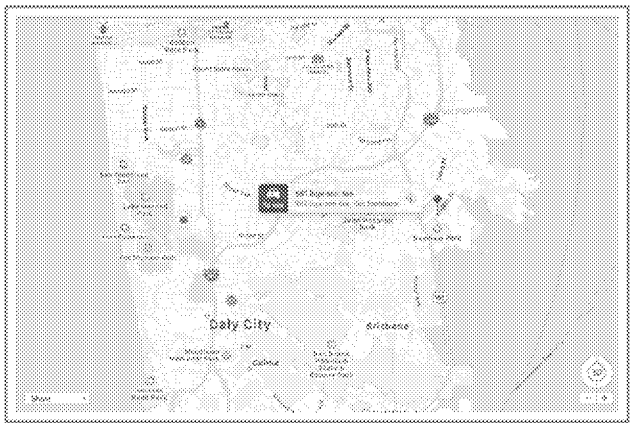




HP Biomonitoring evaluated three members of a nuclear family living adjacent to HPS found to have excessive amounts of the radionuclide vanadium detected on urine screening. Vanadium is identified as a chemical of concern at HPS:

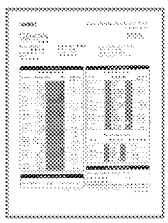


<u>Vanadium is both naturally occurring and a product of manufacturing high speed steel tools. Its presence in three members of a family living at the southwest tip of HPS should be considered an important "signature" biomarker of toxic environmental exposure. A PharmD consultant representing the State Toxic labs expressed this opinion.</u>



Location of HP Biomonitoring family with toxic levels of Vanadium detected on Genova Diagnostics CUEP Screening

Vanadium is toxic to humans in high doses and when inhaled causes irritation of the upper airway mucosa leading to headaches and nosebleeds. Two members of the family with Vanadium detected above Total Maximum Permissible levels presenting with headaches and/or nosebleeds. Vanadium is valuable in the manufacturing industry due to its malleable, ductile and corrosion resistant qualities. Found in phosphate rock and crude oils, it contains one stable and one radioactive isotope - V-50.



Additionally, it should be noted that the Navy's plans to use a "two foot soil cover as a means of preventing exposure to the radioactive and chemical contamination at HPS is challenged by William Bianchi, Phd - soil physicist in Plant Uptake of Radionuclides and Toxic Chemicals from Contaminated Soils Below a Shallow Soil Cover. (August 2019 Committee to Bridge The Gap).

Dr. Bianchi demonstrates, using USDA data, that select plant root systems can extend down below 6 feet and at extensive depths allow uptake of radioactive and chemical contaminants into plants and through hydraulic redistribution allow vegetation to access these toxins from deep within soil layers. "Once accessed, plants are capable of transferring toxic materials through their roots to the surface, providing new pathways for human exposure.

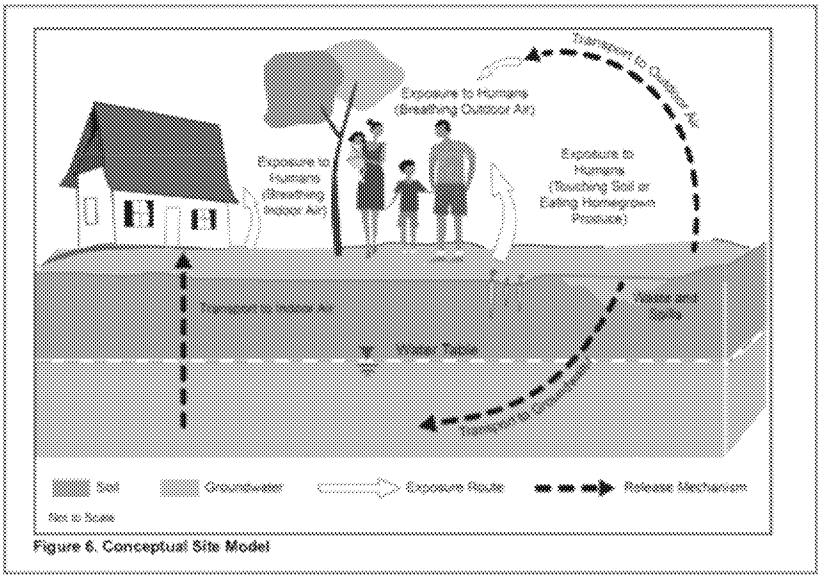
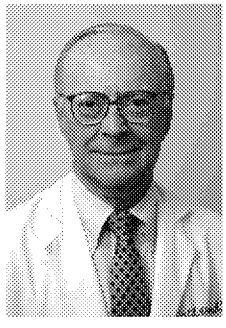


Figure 6. Conceptual Site Model



Professor Emeritus Herbert Abrams is quoted in Stanford Report, October 25, 2005: "There appears to be no threshold below which exposure can be viewed as harmless." Abrams was one of two physicians on the committee of 16 international experts convened by National Research Council's five year study Biological Effects of Ionizing Radiation (BEIR) VII. Exposure to X-rays and gamma rays at low doses increases risk of cancer.

As founding chair of the Radiological Subcommittee of the Hunters Point Shipyard I would conclude with the following comments:

A petition signed by over 200 Bayview Hunters Point community residents has been presented to the Department of the Navy and the document Restoration Advisory Board Implementation Guidelines and the DoD installation should begin the immediate process of informing and educating the community about the purpose of the RAB as required by 10 USC 2705(c) and Executive Order 12580, Superfund Implementation.

The use of soil preliminary remediation goals is essential to developing the Record of Decision for a parcel undergoing remediation at HPS and critical to calculation of the Human Health Risk Assessment's estimates of human exposure to chemicals and radionuclides of concern. I do not support the use of RESRAD risk calculations without simultaneous EPA derived prg's as it will create an "apples versus oranges" scenario if future discussions center on RESRAD alone.

RESRAD is a computer program used to make regulatory decisions about residual radioactivity levels at nuclear sites. It allows the user to specify many features of a site and it's exposure pathways. It derives single radionuclide soil guidelines at maximum total dose. As such, RESRAD is limited at HPS by the sheer number of radionuclides of concern documented in the Final Historical Radiological Assessment.

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